

Assistive Device Use among Community-Dwelling Older Adults: A Profile of Canadians Using Hearing, Vision, and Mobility Devices in the Canadian Longitudinal Study on Aging

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RÉSUMÉ

Il est de plus en plus reconnu que l'utilisation d'aides techniques peut favoriser le vieillissement en santé. La minimisation de l'inconfort et de la perte de fonction, ainsi que l'amélioration de l'autonomie, peuvent avoir un impact physique, psychologique et financier significatif sur les personnes ayant une déficience fonctionnelle, sur les limitations d'activités qui en résultent, les aidants et les collectivités. Toutefois, peu de données sont disponibles concernant l'utilisation des aides techniques par les individus et l'influence de cette utilisation sur la participation sociale. La présente étude consiste en une analyse de données de base de l'ELCV issues de 51 338 personnes âgées de 45 à 85 ans. Les mesures associées à des caractéristiques sociodémographiques, sanitaires et sociales ont été analysées en fonction du sexe et du groupe d'âge. Des tableaux croisés pondérés permettent d'illustrer les corrélations entre les variables indépendantes et l'utilisation d'aides techniques pour l'audition, la vision et la mobilité. Nous avons constaté que l'utilisation d'aides techniques était plus élevée chez les personnes plus âgées, moins scolarisées, veuves, à faible revenu et en moins bonne santé. L'utilisation des aides techniques a présenté des différences liées au sexe et à la participation sociale. Cette étude met en évidence l'importance de l'utilisation des aides techniques pour le bien-être des personnes âgées et de leurs familles.

ABSTRACT

There is increasing recognition that using assistive devices can support healthy aging. Minimizing discomfort and loss of function and increasing independence can have a substantial impact physically, psychologically, and financially on persons with functional impairments and resulting activity limitations, as well as on caregivers and communities. However, it remains unclear who uses assistive devices and how device use can influence social participation. The current analysis used CLSA baseline data from 51,338 older adults between the ages of 45 and 85. Measures of socio-demographic, health, and social characteristics were analyzed by sex and age groups. Weighted cross-tabulations were used to report correlations between independent variables and assistive device use for hearing, vision, and mobility. We found that assistive device use was higher among those who were of older age, had less education, were widowed, had lower income, and had poorer health. Assistive devices were used differently according to sex and social participation, providing insight into assistive device use for the well-being of older adults and their families.

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The global growth in the number and proportion of older adults has a multitude of public health and social policy implications (Gill & Moore, 2013; World Health Organization, 2015). For example, in Canada in 2015, for the first time, persons 65 years of age and older outnumbered children between 0 and 14 years of age, and the proportion of older persons is expected to continue to increase (Statistics Canada Demography Division, 2015). Critically, the prevalence of physical impairments and functional limitations increase with age, especially in later life (Arim, 2015; Gill & Moore, 2013). According to the 2012 Canadian Survey on Disability (Arim, 2015), the mean age of onset of physical impairments is in the early 40s. The prevalence of impairment was found to be 16.1 per cent for persons between 45 and 64 years of age, and rose to 43 per cent for persons 75 years of age and older.

The international Classification of Functioning, Disability and Health (ICF) suggests that impairments are associated with activity limitations and, accordingly, participation limitations (World Health Organization, 2011). Types of impairments most frequently reported include limitations in mobility,¹ hearing, and vision, as well as flexibility, mental health, dexterity, learning (e.g., attention deficit), memory, and the presence of pain (Arim, 2015). Mobility, hearing, and vision limitations especially are not only prevalent, but rise sharply in older ages (Arim, 2015; Feder, Michaud, Ramage-Morin, McNamee, & Beauregard, 2015; Perruccio, Badley, & Trope, 2010; Ramage-Morin, 2016).

There are several negative outcomes associated with these impairments. For example, an inability to walk has been shown to predict subsequent activity limitation defined by basic and instrumental activities of daily living (ADLs/IADLs)² (Fillenbaum & Smyer, 1981),

¹Mobility impairment can refer to the inability of a person to use one or more of his/her extremities, or a lack of strength to walk, grasp, or lift objects. In the current report, however, we define the term narrowly such that mobility impairment refers to an inability to use lower extremities to walk or independently move from place to place.

²Basic activities of daily living (ADLs) and instrumental activities of daily living (IADLs) are adapted from the Older Americans Resources and Services (OARS) Multidimensional Assessment

higher health care cost, mortality (Hardy, Kang, Stundski, & Degenholtz, 2011) and an increased risk of depressive symptoms (Lampinen & Heikkinen, 2003). Low vision is associated with poorer levels of execution with respect to ADLs, symptoms of depression, and feelings of anxiety (Kempen, Ballemans, Ranchor, van Rens, & Zijlstra, 2012). Further, hearing impairment is associated with reduced execution in ADLs and IADLs, poorer health-related quality of life (Chia et al., 2007; Dalton et al., 2003), poorer cognitive functioning (Lin, Thorpe, Gordon-Salant, & Ferrucci, 2011; Lin et al., 2013), and negative impacts on relationships with others (Scarinci, Worrall, & Hickson, 2008).

In fact, these physical impairments may lead to activity limitations and participation restrictions such as limited participation in work and social and community life. Turcotte et al. (2015) reported, based on their multiple case study, that older adults with physical or cognitive impairments were not able to sufficiently participate in social activities outside the home. More specifically, Ramage-Morin (2016) reported that older women, although not older men, with hearing difficulties experienced social isolation (i.e., feeling lonely, lacking a sense of social belonging) (See also Gopinath et al., 2012). Further, Rosso, Taylor, Tabb, and Michael (2013) reported that for older adults, mobility limitations were also associated with reduced social participation. Social participation is particularly important because of the many benefits it provides to older adults. Studies have shown that social participation has a protective role for health and well-being (Adams, Leibbrandt, & Moon, 2011; Gilmour, 2012) and improved survival for older adults (Andrew & Keefe, 2014). These findings suggest that decreased social participation, resulting from increased functional impairments, could be an important but modifiable problem associated with older adults' well-being in an aging society.

Questionnaire (Fillenbaum & Smyer, 1981). ADLs include walking, feeding, dressing/grooming, toileting, bathing, and transferring. IADLs require more complex thinking and include managing finances, managing transportation, shopping and meal preparation, house cleaning and home maintenance, managing communication, and managing medication.

Assistive devices³ are tools and/or technologies that can play a critical role in easing discomforts and minimizing limitations in daily activities caused by functional impairments. The benefits of using assistive devices, especially those for mobility, are well reported in the literature. Mobility devices are aids to help with these functions including walkers, canes, crutches, manual and electric wheelchairs, and motorized scooters. Using mobility devices has been associated with improved ADLs, independence, quality of life, social benefits, confidence, and self-esteem (Brandt, Iwarsson, & Stahle, 2004; Chien & Lin, 2012; Edwards & McCluskey, 2010; Frank, Neophytou, Frank, & de Souza, 2010; Löfqvist, Pettersson, Iwarsson, & Brandt, 2012; Wilson, Mitchell, Kemp, Adkins, & Mann, 2009). In particular, Rousseau-Harrison et al. (2009, 2012) reported that social participation among their study populations (mean ages of 64.2 and 64.3 years, respectively) increased after the use of wheelchairs began, based on the Reintegration to Normal Living Index (RNLI) and users' perception. To a lesser extent, there is also evidence that using assistive devices for vision (Scadden, 1997) and hearing (Chisolm et al., 2007; Weinstein, Sirow, & Moser, 2016) enhance important aspects of life as well.

It is important to note that the prevalence of device use varies for different types of impairments (Arim, 2015; Statistics Canada, 2008). According to Statistics Canada's 2006 survey on assistive technologies, the most commonly used devices were a cane or walking stick for mobility impairments, magnifiers for vision impairments, and hearing aids for hearing impairments (Statistics Canada, 2008). The prevalence of device use is consistent with the prevalence of impairments; rates of mobility impairments were reported to be the highest followed by vision and/or hearing impairments (Arim, 2015; Martin, Zimmer, & Hurng, 2011; Picavet & Hoeymans, 2002).

In Canada, there is an increasing recognition that the use of assistive devices can support healthy aging (e.g., AGE-WELL, <http://agewell-nce.ca/>). The minimizing of discomfort and loss of activity/action resulting from impairment has a substantial physical and financial impact on persons with impairments as well as on their caregivers and communities. Although the use of assistive devices is known to increase with age (Arim, 2015; Kaye, Yeager, & Reed, 2008) and is known to vary

across sexes (Arim, 2015; Fisher et al., 2015; Peterson, Meng, Dobbs, & Hyer, 2016), it remains unclear, especially in the Canadian context, who uses assistive devices and how social participation differs according to device use.

Assessing the characteristics of assistive device users is a critical first step for informing future policy decisions as well as design developments, so that provision of services and care can be efficient and appropriate as well as cost effective (Hollander, Chappell, Prince, & Shapiro, 2007). Therefore, the objective of the current study is to describe the profile of assistive device users in Canada with regard to socio-demographic and health characteristics as well as social characteristics, including social participation.

Methods

Data Source and Study Population

The data for this study were obtained from the CLSA (<https://www.clsa-elcv.ca>) as approved by the CLSA Data and Sample Access Committee. The CLSA is a large, national, longitudinal study that is following more than 50,000 Canadians between the ages of 45 and 85 for 20 years or until death (Raina et al., 2009). All participants provide a core set of information on demographic and lifestyle/behaviour factors, social, physical/clinical, psychological, economic, and health status measures, and health services use.

Participants in the CLSA Tracking were randomly selected from age and sex strata within the 10 Canadian provinces and provided information via computer-assisted telephone interviews ($n = 21,241$). Participants in the CLSA Comprehensive were randomly selected from within 25–50 km of data collection sites in 11 cities across Canada (Victoria, Vancouver, Surrey, Calgary, Winnipeg, Hamilton, Ottawa, Montréal, Sherbrooke, Halifax, and St. John's) and provided in-depth information obtained via face-to-face computer-assisted personal in-home interviews, as well as physical assessments and biospecimen collection at local data collection sites ($n = 30,097$). The current analysis used data collected at baseline (2010–2015) for a total sample of 51,338 older adults. Excluded from the CLSA were (1) residents in the three territories, in some remote regions, in federal First Nations reserves, and in other First Nations settlements in the provinces, (2) full-time members of the Canadian Armed Forces, (3) individuals living in institutions, (4) individuals who were temporary visa holders or had transitional health coverage, (5) individuals unable to respond in English or French, and (6) individuals with cognitive impairment at baseline.

³Assistive devices are defined as those devices and technologies that help individuals maintain or improve their functioning and independence, which may not be maintained otherwise. Examples of assistive devices and technologies include, for example, walkers and wheelchairs, hearing aids, and visual aids other than glasses, which increase mobility, hearing, and vision functioning (World Health Organization, 2019).

Measures

Assistive device use

The measurements of assistive device use for hearing and vision were based on binary responses to a question for each type. For hearing, participants were asked: "Do you use any aids, specialized equipment, or services for persons who are deaf or hard of hearing, for example, a volume control telephone or TV decoder?" The response options were "yes", "no", "don't know/no answer", and "refused". Participants who answered "yes" were further asked to indicate the types of hearing devices that they used. The response options included hearing aid, computer to communicate (e.g., e-mail or chat services), TTY or TTD⁴, message relay service, other phone-related device, closed caption TV or decoder, amplifiers (e.g., FM, acoustic, infrared), visual or vibrating alarm, cochlear implant, or another aid. For vision, participants were asked: "Besides glasses or contact lenses, do you use any aids or specialized equipment for persons who are blind or visually impaired, for example, magnifiers or Braille reading materials?" The response options were "yes", "no", "don't know/no answer", and "refused". Participants who answered "yes" were further asked to indicate the types of vision devices that they used. The response options include magnifiers, braille reading materials, larger reading print materials, talking books, recording equipment or portable note-takers, closed circuit devices (e.g., CCTVs), a computer with braille, large print or speech access, a white cane, a guide dog, or another aid. The measurement of assistive device use for mobility was based on the question: "During the past 12 months, have you used any of the following assistive devices?" Mobility-related devices listed included cane or walking stick, wheelchair, motorized scooter, walker, or leg braces or supportive devices. Participants were classified as assistive device users if they responded "yes" to any of the foregoing questions.

Socio-demographic characteristics

Ethnicity was categorized into two groups⁵: white and other. Marital status was categorized into four groups: single, married/common-law, widowed, and divorced/separated. Educational attainment was categorized into four groups; (1) less than secondary

⁴That is, teletypewriter. These devices help people send text over the phone.

⁵Participants were asked: "People living in Canada come from many different cultural and racial backgrounds. Are you...?" Response options were: White, Chinese, South Asian, Black, Filipino, Latin American, South Asian, Arab, West Asian, Japanese, Korean, North American Indian, Inuit, Metis, and Other. Participants could select multiple options from the list of cultural and racial backgrounds. Note that when responses did not fall into a single category of White, they were categorized as "Other".

school graduation, (2) secondary school graduation, no post-secondary education, (3) some post-secondary education, and (4) post-secondary degree/diploma.⁶ Total annual household income was categorized into six groups; less than \$20,000, \$20,000–\$49,999, \$50,000–\$99,999, \$100,000–\$150,000, more than \$150,000, and unknown.

Health characteristics

The presence of chronic conditions was categorized into six groups: 0, 1, 2, 3, 4, and 5 or more chronic conditions. This was based on responses to a series of questions asking about chronic health conditions diagnosed by a physician (osteoarthritis, arthritis, respiratory, cardiac, neurological, gastrointestinal, vision, cancer, mental health, infections, and other). Participants were classified as having a condition if they responded "yes" to any specific conditions (e.g., high blood pressure, diabetes, heart disease, angina, heart attack, peripheral vascular disease, stroke) within a given condition (e.g., cardiac) when asked, "Has a doctor ever told you that you have...?". The total number of chronic conditions per respondent was tabulated using all 11 questions (min = 0, max = 11). The measurement of perceived health was based on responses to the question: "In general, would you say your health is excellent, very good, good, fair, or poor?" The response options were dichotomized to reflect positive (excellent/very good/good) versus poor (fair/poor) health. Home care was categorized into four groups: formal, informal, both, and none, based on responses to two questions asking about formal care at home provided by professionals and informal care at home provided by family, friends, or neighbours. For formal care, participants were asked: "During the past 12 months, did you receive short-term or long-term professional assistance at home, because of a health condition or limitation that affects your daily life, for any of the following activities?" The list of types of care included (1) personal care such as assistance with eating, dressing, bathing or toileting; (2) medical care such as help taking medicine or help with nursing care; (3) managing care such as making appointments; (4) help with activities such as housework; (5) home maintenance, or outdoor work; (6) transportation, including trips to health care providers or for shopping; and (7) meal preparation or delivery. For informal care, a similar question was asked: "During the past 12 months, did you receive short-term or long-term assistance from family, friends, or neighbours because of a health condition or limitation that affects your daily life, for any of the following

⁶We do not include participants whose responses did not fall within these four categories (i.e., at least one required question was not answered) because there are only small number of people.

activities?" The list of types of care was the same as the formal care question.

Social network characteristics

The measurement of living arrangements was based on the question "How many people, not including yourself, currently live in your household?" The responses were dichotomized to reflect living alone versus living with others. The measurement of social participation was based on responses to a series of eight questions asking how often in the past 12 months participants had participated in eight different community-related activities (at least once a day, at least once a week, at least once a month, at least once a year, never). The response options were dichotomized to reflect frequent and infrequent social participation (Gilmour, 2012). Frequent participation was classified as "at least weekly" in the last 12 months for activities typically engaged in often: family or friendship activities outside the household; church or religious activities such as services, committees, or choirs; sports or physical activities with other people; and other recreational activities, including hobbies, bingo, and other games. Frequent participation was classified as "at least monthly" in the last 12 months for activities typically engaged in less often: educational and cultural activities involving other people such as attending courses, concerts or visiting museums; service club or fraternal organization activities; neighbourhood, community, or professional association activities; and volunteer or charity work. For the measurement of social isolation participants were asked to think about the past week when they answered the question: "How often did you feel lonely?" The response options were dichotomized to reflect lonely (all of the time, occasionally, some of the time) versus not lonely (rarely or never) (Ramage-Morin, 2016).

Analysis

Measures of socio-demographic, health, and social characteristics were analyzed by sex⁷ and age groups (45–64 years of age and 65–85 years of age). Weighted cross-tabulations were used to assess differences between independent variables and assistive device use (hearing, vision, and mobility). Individuals with missing data (i.e., missing because participants did not know the answer, did not provide an answer, or refused to give an answer) were excluded from the analyses with the exception of total household income, for which we included an 'unknown' category.

⁷We are aware that there is an interest in distinguishing between sex (biologically defined) and gender (socially defined); however, the participants in the CLSA study at baseline were simply asked: "Are you female or male?" We make the assumption that it is biological sex that is reported here.

Sample Weights

We used sampling weights with the aim of obtaining estimates that were representative of the eligible population in Canada (<https://www.clsa-elcv.ca/>). Each individual was assigned a weight that was based on that person's inclusion probability. The Tracking cohort was recruited into strata based on province, sex, age group; the Comprehensive cohort was recruited based on sex, age group, and residence within data collection site catchment area. This resulted in 136 strata for the Tracking cohort and 56 strata for the Comprehensive cohort. The overall estimated baseline response rates of 9 per cent for Tracking and 10 per cent for Comprehensive were based on the product of pre-recruitment rates and enrollment rates, accounting for eligibility, and were similar to other large cohorts in Canada and internationally. Specifically, the pre-recruitment rate was based on return of "consent to contact forms" for those contacted via the Canadian Community Health Survey Cycle 4.2 on Healthy Aging or via provincial health card registry mailings, and "consent to hear more about the CLSA" for those contacted via random digit dialing. The enrollment rate was the percentage of pre-recruits who completed baseline data collection. The use of trimmed inflation weights allowed us to control for sampling misrepresentation, including unequal probabilities of sampling and non-response, and to infer findings to the eligible Canadian population.

Results

The study sample of 51,338 participants ([Appendix Table 1](#)) was weighted to represent 13.2 million Canadians between 45 and 85 years of age, with a mean age of 60.3. Males and females were approximately equally represented (48.5% versus 51.5% respectively). One fifth (20.0%) of community-dwelling Canadians 45–85 years of age reported using an assistive device for hearing, vision, and/or mobility.

Overall Patterns of Device Use

Between 2010 and 2015, an estimated 1,400,000 females and 1,300,000 males in Canada between the ages of 45 and 85 reported currently using at least one assistive device for hearing, vision, or mobility. Mobility devices were used most often, across all sex and age groups ([Table 1](#)). Rates of device use increased with age regardless of the type of device. Mobility and vision devices were used most often by females, whereas hearing devices were used most often by males. These sex differences were greater in the 65–85-year-old group than in the 45–64-year-old group.

Device Use and Socio-Demographic Characteristics

Table 2 shows the prevalence of assistive device use by selected socio-demographic characteristics. With respect to marital status, those who were married had the lowest prevalence of any device use, and those who were widowed had the highest. The prevalence of any device use among widowed Canadians (37.5% for females and 37.3% for males) was more than twice as high as for married Canadians. When device use was separated out by specific device, the same pattern was observed with mobility devices in all age and sex groups. Those in the lower education and income categories had the highest prevalence of any device use. Generally, Canadians with no post-secondary education reported the highest use for all types of device. As for income, the rates of any device use in the lowest income groups (< \$20,000 annually) (36.1% and 35.9% for females and males) were more than three times as high as the rates in the highest income group (> \$150,000 annually). Particularly, the rates of hearing device use in the 45–64-year-old, lowest income groups (2.8% and 4.2% for females and males, respectively) were more than twice as high as in the highest income group in the same age and sex categories. In addition, the rates of vision and mobility device use in the 45–64-year-old, lowest income groups (11.5% and 12.3% for females and males, respectively, for vision, and 27.5% and 23.7% for females and males, respectively, for mobility) were more than four times as high as in the highest income group in the same age and sex categories. With regard to hearing devices, however, those whose income was unknown in the 65–85-year-old groups (8.3% for females and 12.9% for males) also reported high use.

Device Use and Health Characteristics

Table 3 shows the prevalence of assistive device use by selected health characteristics. When examined by number of chronic conditions, those who reported more than five chronic conditions had the highest prevalence of any device use (37.4% for females and 41.8% for males). The prevalence of device use increased as the number of chronic conditions increased, regardless of the device type in all age and sex groups. With respect to home care, those who reported not receiving either formal or informal care had the lowest prevalence of any device use, and those who received both formal and informal home care had the highest. The rates of any device use for Canadians receiving both types of home care (70.0% for females and 73.7% for males) were more than four times as high as for Canadians receiving neither type of home care. When device use was separated out by specific device, the same pattern was observed with mobility devices in all age and sex groups. With regard to hearing and vision devices, however, Canadians

receiving only formal home care reported highest use. For example, the rates of hearing device use in 65–85-year-old Canadians receiving only formal care (10.9% for females and 20.8% for males) were highest in the same age and sex categories. When examining subjective perception of health, those who perceived their health as poor had the highest prevalence of any device use. Moreover, the rates of any device use in Canadians perceiving their health as poor (54.3% for females and 56.2% for males) were almost five times as high as for Canadians perceiving their health as excellent. Further, the rates of device use increased as perceived health became worse, regardless of the device type. This pattern was most clearly seen for mobility devices.

Device Use and Social Characteristics

Table 4 shows the prevalence of assistive device use by selected social characteristics. Those living alone, reporting infrequent social participation, and feeling lonely had higher prevalence of any device use. With respect to living arrangements, Canadians living alone reported the highest use of all devices compared with Canadians living with others, in all age and sex groups except one: male Canadians 65–85 years old living with others (12.2%) reported the highest use of hearing devices. With respect to social participation, Canadians with infrequent social participation reported the highest use of vision and mobility devices in all age and sex groups. As for hearing devices, 45–64-year-old females (1.4%) and 65–85-year-old females (7.0%) and males (12.4%) with frequent social participation reported higher use of hearing devices than those with infrequent social participation. In all age, sex, and device groups, those who reported being lonely had higher use of devices.

Discussion

In the current study, as the first step to investigating assistive device use among older adults in Canada, we have identified those who use hearing devices, vision devices, and mobility devices, and described the frequencies with which they use these devices according to socio-demographic, health, and social network factors. Many of the characteristics of device users are supported by the existing literature, and were also common across devices.

The observation that older Canadians (i.e., those in the 65–85-year-old group) were more likely to use assistive devices was consistent with the literature (Arim, 2015; LaPlante & Kaye, 2010) as well as being a common perception in society. A point of note is that our findings reflect those who receive assistive devices, but may not be indicative of those who need assistive devices (Gordon, Kerzner, Sheldon, & Hansen, 2007).

Table 1: The weighted prevalence of assistive device use by sex and age, population 45–85 years of age, CLSA 2010–2015.

Age Group	Number of Canadian Population '000 (%) ^a		Any Device Use (%) ^b		Hearing Device Use (%) ^c		Vision Device Use (%) ^c		Mobility Device Use (%) ^c	
	F	M	F	M	F	M	F	M	F	M
45–64	4,600 (67.2)	4,500 (69.7)	14.7	15.2	1.4	2.6	5.3	4.7	9.5	9.1
65–85	2,200 (32.8)	1,900 (30.3)	32.0	29.9	6.8	12.1	10.6	7.7	20.4	14.7
Total	6,800 (100.0)	6,400 (100.0)	20.4	19.6	3.1	5.5	7.0	5.7	13.0	10.8

Note. ^a Number of Canadian population in thousands. Column total of % in brackets adds up to 100% (with occasional round up discrepancies). ^b Use of any one of devices (hearing, vision, and/or mobility), representing % associated row total given sex and age group. For example, 14.7% of females in the 45–64-year-old group reported using any device (shown), whereas 85.3% of females in the same group did not report using any device (not shown), adding up to 100% (not shown). ^c Use of hearing, vision, and mobility devices, representing % associated row total given sex and age group. For example, 1.4% of females in the 45–64-year-old group reported using a hearing device (shown) whereas 98.6 % of females in the same group did not report using a hearing device (not shown).

The observation that Canadians with lower income and educational attainment used assistive devices at higher rates than those with higher income and education was consistent with the literature as well (LaPlante & Kaye, 2010; Shields, 2004). Shields (2004) in a Canadian study of 155,000 individuals 15 years of age and older and LaPlante and Kaye (2010) in a United States study of 217,565 individuals 18 years of age and older also showed that those with lower income and educational attainment had higher rates of mobility device use. It has been suggested that education is a protective factor such that onset of activity restrictions would be delayed for people with high education (Lin & Wu, 2014). It is also possible that once activity restrictions develop, people with higher education may not take up the use of assistive devices as much as people with lower education. It could be hypothesized that this is because they have the resources to compensate in other ways, such as by hiring help. It may also be because of stigma, or device use not fitting their ideal self-image.

The observation that the prevalence of assistive device use was highest among those with low income was somewhat surprising, as it has been reported that cost is one of the major barriers for not using assistive devices (Gopinath et al., 2011; Gordon et al., 2007; McGrath & Astell, 2017; Statistics Canada, 2008). It may be that the greater proportion of individuals in the lower income group used assistive devices that were inexpensive. The most commonly used vision devices other than glasses or contact lenses in the current study were magnifiers (87%). The most commonly used mobility devices were a cane or walking stick (46%) followed by a walker (25%) and a leg braces or supportive devices (20%), which are relatively inexpensive devices.

There are provincial health insurance programs in Canada; however, these may be viewed as a barrier or

inconvenience rather than a support, because most programs cover only some devices, and only part of the entire cost. In addition, there are certain criteria for eligibility to apply for these programs, possibly excluding individuals in need from obtaining necessary devices. Further, some vendors ask for up-front payment, and the cost for repair is not included in the programs (Gordon et al., 2007). Lack of full support especially affects those who need assistive devices but have lower income. In addition, there is lack of uniformity across Canada in government funding programs pertaining to assistive devices (Wang, Schreiber, Durocher, & Wilson, 2017), making it difficult to evaluate the role of income.

Consistent with the literature, our analysis also identified that Canadians with poor health have the highest prevalence of assistive device use. It is possible that having poor health, reflected by having a greater number of chronic conditions and/or receiving home care, especially formal care, may inevitably lead to greater contact with health services. In this way, individuals may learn about their impairments, as well as available supports, including assistive devices. Larsen, Mortensen, Kristensen, and Hounsgaard (2018) reported in their review study that health care professionals play an important role when an individual is becoming an assistive device user. Critically, associations between lower income and chronic conditions were reported in the literature; poorer people are most likely to be at risk of developing chronic diseases (Canadian Institute for Health Information, 2016; World Health Organization n.d.). Therefore, the number of chronic health conditions rather than income, per se, may be responsible for the increased rates of assistive device use.

Marital status can be a predictor of assistive device use too. Widowed Canadians reported higher rates of assistive device use, regardless of sex. However, marital

Table 2: The weighted prevalence of socio-demographic characteristics and any assistive device use by socio-demographic characteristics (A) and the weighted prevalence of individual assistive device use by socio-demographic characteristics (B), population 45–85 years of age, 2010–2015.

A	Number of Canadian Population'000 (%) ^a		Any Device Use(%) ^b	
	F	M	F	M
Ethnicity				
White	6,500 (95.3)	6,000 (94.1)	20.6	19.9
Other	320 (4.7)	380 (5.9)	14.9	14.6
Education				
Less than secondary	530 (9.9)	470 (9.0)	22.7	21.9
Secondary	590 (11.1)	910 (17.3)	22.6	24.7
Some post-secondary	1,800 (34.5)	1,200 (22.3)	20.6	17.3
Post-secondary	2,300 (43.5)	2,700 (50.6)	16.5	15.5
Marital status				
Single	550 (8.1)	490 (7.6)	20.7	20.9
Married	4,700 (68.5)	5,200 (81.4)	17.2	18.5
Widowed	750 (11.0)	200 (3.1)	37.5	37.3
Divorced/separated	850 (12.4)	510 (7.9)	22.2	22.6
Household income				
<\$20,000	430 (6.3)	230 (3.5)	36.1	35.9
\$20,000-\$50,000	1,700 (25.2)	1,200 (19.0)	27.9	27.9
\$50,000-\$100,000	2,200 (32.6)	2,300 (35.8)	17.7	19.8
\$100,000-\$150,000	1,100 (16.6)	1,300 (20.2)	13.9	15.3
>\$150,000	850 (12.4)	1,100 (17.9)	9.6	10.8
Unknown	470 (6.8)	240 (3.7)	26.0	26.0

B	Different Type of Device Use (%) ^c											
	Hearing				Vision				Mobility			
	Age 45-64		Age 65-85		Age 45-64		Age 65-85		Age 45-64		Age 65-85	
	F	M	F	M	F	M	F	M	F	M	F	M
Ethnicity												
White	1.4	2.7	6.9	12.0	5.4	4.9	10.6	7.8	9.5	9.1	20.5	14.7
Other	1.2	1.5	3.4	13.4	3.7	2.1	10.3	6.5	9.1	8.6	14.2	14.7
Education												
Less than secondary	1.4	4.6	8.9	16.5	9.7	6.7	10.9	8.5	13.6	14.4	24.0	19.6
Secondary	1.2	3.2	7.1	11.9	6.1	4.8	9.2	5.8	10.7	14.6	18.7	16.4
Some post-secondary	1.1	2.4	4.8	12.9	6.7	4.9	12.2	7.4	12.1	12.0	22.2	15.2
Post-secondary	1.4	2.4	6.4	11.4	4.8	4.5	10.7	8.0	8.7	7.6	19.4	13.6
Marital status												
Single	0.9	2.1	3.6	8.0	6.2	7.3	13.4	10.8	11.6	11.1	22.1	17.9
Married	1.4	2.7	6.4	12.2	4.9	4.2	8.6	7.1	8.8	8.5	16.2	13.4
Widowed	2.9	2.1	8.6	15.5	7.8	6.2	13.0	12.8	14.4	14.9	27.6	24.0
Divorced/ Separated	1.0	2.6	5.8	9.9	6.5	7.2	12.2	8.0	10.9	11.5	21.6	18.0
Household income												
<\$20,000	2.8	4.2	5.9	9.3	11.5	12.3	12.9	12.5	27.5	23.7	26.5	26.3
\$20,000-\$50,000	1.7	3.6	6.9	12.7	8.6	7.2	12.2	9.5	12.7	14.8	21.6	16.9
\$50,000-\$100,000	1.2	2.9	6.5	11.1	4.9	4.9	9.0	6.6	8.8	9.2	15.9	13.0
\$100,000-\$150,000	1.1	1.7	5.8	15.0	4.4	3.9	7.1	7.5	7.4	6.7	16.6	11.9
>\$150,000	1.0	2.0	7.1	10.9	2.8	2.5	6.5	5.8	5.2	5.5	16.9	9.8
Unknown	1.9	3.9	8.3	12.9	4.0	6.2	9.3	6.2	10.5	11.4	24.6	21.1

Note. ^a Number of Canadian population in thousands. Column total of % in brackets adds up to 100% (with occasional round up errors). ^b Use of any devices (hearing, vision, and/or mobility), representing % associated row total given sex and socio-demographic characteristics. For example, 20.6% of white women reported using any device (shown), whereas 79.4% of women in the same group did not report use of any device (not shown), adding up to 100% (not shown). ^c Use of hearing, vision, and mobility devices, representing % associated row total given sex, age group, and socio-demographic characteristics. For example, 1.4% of white females in the 45–64-year-old group reported using hearing devices (shown), whereas 98.6% of white females in the same group did not report use of hearing devices (not shown).

status is difficult to interpret because it can reflect income, physical and psychological health, or availability of support, all of which could in turn affect assistive device use.

Some of the characteristics of the device users were unique to specific devices. The prevalence of device use was not uniform among those using hearing, vision, and mobility devices. Rates of Canadians using mobility devices were higher than rates of Canadians using hearing and vision devices. This pattern was also found in studies examining the entire Canadian population 15 years of age and older (Arim, 2015; Statistics Canada, 2008). It is possible that the greater prevalence of mobility devices may simply reflect the greater prevalence of mobility impairments (Arim, 2015). It is also possible that the greater prevalence is reflecting the availability, awareness of, and affordability of assistive devices. In fact, devices or services for mobility issues are more commonly funded than hearing and vision devices (Wang et al., 2017). Lack of awareness/knowledge, for example, of vision devices was reported as a critical barrier to technology acquisition (Gold, Zuvella, & Hodge, 2006; McGrath & Astell, 2017). According to McGrath and Astell (2017), their participants misunderstood what services were available to them, believing that they had to be legally blind to access low vision services from the Canadian National Institute for the Blind (CNIB).

The sex difference seen in device use, especially hearing and mobility devices, was consistent with existing literature. In the current study, hearing device use was higher among Canadian males than females. Relatedly, Corna, Wade, Streiner, and Cairney (2009) reported in a Canadian study of adults 50 years of age and older that men had higher rates of corrected and uncorrected hearing impairment than women. Conversely, we found that mobility device use was higher among Canadian females than males. This is consistent with another Canadian study; Smith, Ciesbrecht, Mortenson, and Miller (2016) reported that among older adult manual wheelchair, power wheelchair and scooter users combined a greater proportion were women (54.5 % aged 45-64; 70.8% aged 65-74 and 62.1% aged 75+). (See Kaye, Kang, & LaPlante, 2000; LaPlante & Kaye, 2010 for similar patterns in United States studies.) We also found that the sex difference was amplified at later life such that greater difference between males and females was observed in Canadians 65–85 years of age than in Canadians 45–65 years of age, regardless of the types of device use (see also Smith et al., 2016).

Regarding social connectedness, there is a difference between hearing device use and vision and mobility device use. Those with hearing devices had a higher prevalence of social participation; hearing assistive

device users tended to participate in social activities more frequently. Hearing devices are important for improving basic communication function. This could explain why married Canadians had higher rates of using hearing devices, reflecting other persons' needs as well as their own needs. Relatedly, the sociocultural context, including family, friends, and society, plays an important role when individuals are evaluating and acknowledging need, and incorporating the devices into their lives (Larsen et al., 2018). On the other hand, Canadians with vision and mobility devices had a lower prevalence of social participation than those without such devices. This cannot be interpreted as causal, but it highlights the need to further study and understand the impact of sensory losses on social participation. Vision and mobility devices are important for improving basic transportation functions and instrumental activities of daily living; this could explain why Canadians living alone had higher rates of use of these devices. Despite the obvious positive impact of these devices on social life, there is still a negative impact associated with device use, such as stigma, for example. Vision and especially mobility devices are "visible" and may affect personal desired self-image (Larsen et al., 2018). For some individuals, the benefits of using assistive devices may not outweigh the potential stigma. Therefore, there is more room for devices to be improved in order to have positive impacts on social connectedness.

The current study is a cross-sectional descriptive study, and thus limited in investigating the dynamic nature of aging and the use of assistive devices across time. Also, we are limited in studying differences in assistive device use according to gender and gender roles. Further, an exploration of the differences in assistive device use by ethnicity was limited. Participants other than white comprised approximately 5 per cent of the total population in the current study whereas they comprise closer to 20 per cent of the total Canadian population (Chui, 2013). This is, in part, due to the criterion that CLSA participants had to be able to respond in English or French (i.e., selection bias). Similarly, males typically have a shorter lifespan; with death, the characteristic of interest is no longer observable, resulting in survival bias. It should also be noted that the application of sampling weights, at best, allows findings to be generalizable to the Canadian population. Yet, the current study shows that sociocultural context is an important factor impacting differences in assistive device use, supporting a current view in the literature (e.g., Larsen et al., 2018). At the same time, the current study shows various factors that can affect processes of acquiring and using assistive devices. Despite the limitations, these results give insight into the current status of assistive device use among older adults in Canada. They provide a snapshot of the patterns of use for

Table 3: The weighted prevalence of health characteristics and any assistive device use by health characteristics (A) and the weighted prevalence of individual assistive device use by health characteristics (B), population 45–85 years of age, 2010–2015.

A	Number of Canadian Population '000 (%) ^a				Any Device Use(%) ^b							
	F		M		F		M					
Number of chronic conditions												
0	390 (5.7)		580 (9.1)		6.0		8.1					
1	950 (13.9)		1,300 (20.8)		8.1		10.3					
2	1,300 (19.3)		1,600 (24.2)		11.7		15.5					
3	1,300 (19.5)		1,300 (20.3)		16.6		20.0					
4	1,100 (16.5)		820 (12.8)		24.2		27.8					
≥5	1,700 (25.1)		820 (12.8)		37.4		41.8					
Health services use												
Formal	160 (2.3)		110 (1.8)		53.9		54.3					
Informal	750 (11.0)		480 (7.4)		44.3		42.6					
Both	210 (3.1)		120 (1.8)		70.0		73.7					
None	5,700 (83.6)		5,700 (89.0)		14.5		15.9					
Perceived health												
Excellent	1,400 (20.4)		1,300 (19.6)		10.9		12.2					
Very good	2,700 (39.5)		2,500 (38.6)		15.8		16.4					
Good	1,900 (28.3)		1,900 (30.4)		23.5		21.2					
Fair	620 (9.1)		580 (9.0)		41.5		34.7					
Poor	180 (2.6)		150 (2.4)		54.3		56.2					
Different Type of Device Use (%)^c												
B	Hearing				Vision				Mobility			
	Age 45-64		Age 65-85		Age 45-64		Age 65-85		Age 45-64		Age 65-85	
	F	M	F	M	F	M	F	M	F	M	F	M
Number of chronic conditions												
0	0.7	1.6	3.8	3.2	2.9	3.3	5.3	6.1	2.0	3.0	3.0	3.9
1	0.6	2.1	2.4	6.6	3.0	3.3	5.6	4.4	3.8	4.1	5.1	5.5
2	1.0	2.1	4.0	10.1	3.8	4.1	8.5	6.8	5.0	7.3	8.9	8.1
3	1.3	2.9	7.5	10.9	4.1	4.9	7.9	6.9	8.1	9.4	12.9	12.9
4	1.6	3.3	7.5	13.9	6.9	5.9	9.9	8.2	12.8	14.7	18.2	17.5
≥5	2.6	5.2	7.9	18.0	10.3	10.9	13.9	11.2	22.1	29.0	32.4	27.0
Health services use												
Formal	1.6	7.7	10.9	20.8	12.2	5.4	16.6	14.9	34.9	42.2	49.2	45.0
Informal	1.9	2.2	7.6	19.6	10.0	7.5	14.1	14.8	33.4	31.6	43.6	37.3
Both	1.5	5.4	7.8	19.5	13.4	16.9	21.6	12.9	53.5	62.5	72.6	67.0
None	1.3	2.5	6.4	11.0	4.4	4.3	9.0	6.8	4.9	5.8	12.3	10.3
Perceived health												
Excellent	1.3	1.8	5.1	9.5	3.0	3.1	7.5	5.4	3.3	4.2	9.3	7.6
Very good	1.1	2.3	6.5	11.9	4.4	3.8	9.0	6.9	6.2	6.5	13.9	10.4
Good	1.5	2.4	6.3	12.5	5.6	5.5	13.1	9.0	11.0	9.7	23.9	17.0
Fair	1.6	3.8	12.0	15.3	12.7	7.9	14.2	10.7	25.5	21.1	42.7	29.9
Poor	2.5	10.5	7.7	20.5	13.1	13.6	11.6	13.3	42.8	40.8	59.6	50.4

Note. ^a Number of Canadian population in thousands. Column total of % in brackets adds up to 100% (with occasional round up errors). ^b Use of any devices (hearing, vision, and/or mobility), representing % associated row total given sex and health characteristics. For example, 6.0% of women without a chronic condition (i.e., number of chronic conditions = 0) reported using any device (shown), whereas 94.0% of women in the same group did not report using any device (not shown), adding up to 100% (not shown). ^c Use of hearing, vision, and mobility devices, representing % associated row total given sex, age group, and health characteristics. For example, 1.6% of females receiving formal care at home in the 45–64-year-old group reported using hearing devices (shown), whereas 98.4% of females receiving formal care in the same group did not report using hearing devices (not shown). ^d We suppressed cells where there were fewer than 10 participants in cells in raw data.

Table 4: The weighted prevalence of social characteristics and any assistive device use by social characteristics (A) and the weighted prevalence of individual assistive device use by social characteristics (B), population 45–85 years of age, 2010–2015.

A	Number of Canadian Population '000 (%) ^a				Any Device Use (%) ^b			
	F		M		F		M	
Living arrangement								
Live with others	5,400 (78.8)		5,600 (87.5)		17.6		18.7	
Live alone	1,400 (21.2)		8,000 (12.5)		30.7		26.2	
Social participation								
Frequent	6,000 (88.8)		5,400 (84.9)		19.7		18.9	
Infrequent	760 (11.2)		970 (15.2)		25.4		23.6	
Social isolation								
Not lonely	5,100 (75.5)		5,100 (80.1)		18.3		18.3	
Lonely	1,700 (24.5)		1,300 (19.9)		26.5		24.9	

B	Type of device use (%) ^c											
	Hearing				Vision				Mobility			
	Age 45-64		Age 65-85		Age 45-64		Age 65-85		Age 45-64		Age 65-85	
	F	M	F	M	F	M	F	M	F	M	F	M
Living arrangement												
Live with others	1.3	2.6	6.5	12.2	4.9	4.4	9.1	7.0	8.9	8.6	17.6	14.0
Live alone	1.5	2.8	7.3	11.5	7.9	7.5	12.9	11.4	13.3	12.8	24.8	18.9
Social participation												
Frequent	1.4	2.5	7.0	12.4	5.1	4.5	10.2	7.4	9.1	8.5	19.2	13.8
Infrequent	1.2	3.2	5.4	10.5	7.3	6.3	13.4	9.9	12.2	11.8	29.9	20.3
Social isolation												
Not lonely	1.2	2.5	6.6	12.0	4.4	4.0	10.4	6.9	8.3	8.1	18.9	14.1
Lonely	1.9	2.8	7.2	12.6	8.2	7.7	10.8	11.4	13.2	13.1	24.3	17.6

Note. ^a Number of Canadian population in thousands. Column total of % in brackets adds up to 100% (with occasional round up errors). ^b Use of any devices (hearing, vision, and/or mobility), representing % associated row total given sex and social characteristics. For example, 17.6% of women living with others reported use of any device (shown), whereas 82.4% of women in the same group did not report using any device (not shown), adding up to 100% (not shown). ^c Use of hearing, vision, and mobility devices, representing % associated row total given sex, age group, and social characteristics. For example, 1.3% of females living with others in the 45–64-year-old group reported using hearing devices (shown), whereas 98.7% of female living with others in the same group did not report using hearing devices (not shown).

assistive devices related to hearing, vision, and mobility, and the health and social characteristics of assistive device users in Canada.

Conclusion

Assistive devices for mobility, hearing, and vision are used by one in five community-dwelling older adult Canadians. Consistent with the literature, we found that assistive device use increased by age category, and that mobility devices were used most often. Assistive device use was highest for Canadians who have less education, are widowed, have lower income, or have poorer health. Males were more frequent users of hearing devices whereas females were more frequent users of vision and mobility devices. Hearing device users reported higher levels of social participation than non-users in the current study. However, we found that

device users generally rated their overall health lower than non-users. These findings contribute to the body of knowledge regarding assistive device use among older adults in Canada.

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Appendix

Table 1: The unweighted prevalence of assistive device use by social characteristics, population 45–85 years of age 2010/2015.

	Sample (n)		Sample (%)		Different Type of Device Use (%) ^a					
					Hearing		Vision		Mobility	
	F	M	F	M	F	M	F	M	F	M
Age group										
45-64	15,406	14,441	58.9	57.3	1.8	2.9	6.3	5.7	9.5	8.8
65-85	10,749	10,742	41.1	42.7	7.6	13.3	12.2	9.4	20.1	15.4
Total	26,155	25,183	100	100	4.1	7.3	8.7	7.3	13.9	11.7
Ethnicity^b										
White	24,993	23,776	95.6	94.5	4.2	7.4	8.8	7.4	13.9	11.7
Other	1,147	1,373	4.4	5.5	2.4	5.1	7.9	6.1	12.8	11.1
Total	26,140	25,149	100	100	4.1	7.3	8.7	7.3	13.9	11.7
Education										
No post-secondary	2,004	1,865	9.6	9.0	4.1	8.4	10.0	7.6	16.9	14.5
Trade certificate	2,408	3,497	11.5	16.8	4.0	8.4	9.7	8.7	13.9	12.4
Some post-secondary	7,010	4,227	33.5	20.4	4.2	6.1	8.9	7.8	13.7	11.7
Post-secondary	9,488	11,177	45.4	53.8	3.5	6.3	7.1	6.3	11.7	9.5
Total	20,910	20,766	100	100	3.9	6.8	8.3	7.1	13.1	10.9
Marital status										
Single	2,342	2,010	9.0	8.0	2.5	4.0	9.7	9.4	16.1	13.4
Married	15,715	19,538	60.1	77.6	3.4	7.6	6.9	6.4	10.6	10.7
Widowed	3,874	1,295	14.8	5.1	8.8	12.6	12.9	12.1	23.7	19.5
Divorced/Separated	4,216	2,334	16.1	9.3	3.7	5.1	11.0	10.0	15.6	13.9
Total	26,147	25,177	100	100	4.1	7.3	8.7	7.3	13.9	11.7
Household income										
<\$20,000	1,892	1,021	7.9	4.3	5.4	6.5	15.7	14.1	27.0	24.1
\$20,000~\$49,999	7,133	5,096	29.6	21.2	5.5	9.5	12.1	10.1	17.5	15.5
\$50,000~\$99,999	8,210	8,917	34.2	37.1	3.7	8.2	7.5	7.2	11.6	11.5
\$100,000~\$150,000	3,874	4,865	16.1	20.3	2.3	6.0	5.6	5.8	8.2	8.7
> \$150,000	2,916	4,123	12.2	17.2	2.4	4.1	4.5	4.2	6.9	7.0
Unknown	2,150	1,161	8.2	4.6	6.1	8.9	7.4	7.3	18.9	14.3
Total	26,155	25,183	100	100	4.1	7.3	8.7	7.3	13.9	11.7
Number of chronic conditions										
0	1,241	1,815	4.7	7.2	1.1	2.2	5.0	4.4	2.6	3.3
1	3,130	4,403	12.0	17.5	1.8	4.0	4.4	4.7	4.5	4.0
2	4,732	5,899	18.1	23.4	2.4	5.4	6.1	6.5	5.7	7.3
3	5,122	5,417	19.6	21.5	3.7	7.8	7.6	7.4	9.9	10.7
4	4,615	3,667	17.6	14.6	4.7	9.4	9.2	7.9	14.2	16.0
5+	7,315	3,982	28.0	15.8	6.8	13.6	13.4	11.9	27.7	27.6
Total	26,155	25,183	100	100	4.1	7.3	8.7	7.3	13.9	11.7
Health service utilities										
Formal	718	513	2.8	2.0	8.9	16.4	18.9	12.1	44.9	42.3
Informal	2,844	1,865	10.9	7.4	5.1	9.1	12.6	13.6	36.4	36.3
Both	823	481	3.2	1.9	7.9	14.4	20.2	16.6	66.5	66.5
None	21,770	22,324	83.2	88.7	3.7	6.8	7.5	6.5	7.9	7.7
Total	26,155	25,183	100	100	4.1	7.3	8.7	7.3	13.9	11.7
Perceived health										
Excellent	5,196	4,777	19.9	19.0	3.4	5.9	5.9	5.3	5.8	5.9
Very good	10,667	9,876	40.8	39.3	3.8	7.0	7.6	6.1	9.3	8.2
Good	7,446	7,692	28.5	30.6	4.5	7.6	10.3	8.5	17.3	13.0
Fair	2,255	2,292	8.6	9.1	6.2	9.3	13.9	11.1	33.8	25.9
Poor	571	522	2.2	2.1	5.4	12.8	14.7	13.2	48.5	44.6
Total	26,135	25,159	100	100	4.1	7.3	8.7	7.3	13.9	11.7

Continued

Table 1: Continued

	Sample (n)		Sample (%)		Different Type of Device Use (%) ^a						
					Hearing		Vision		Mobility		
	F	M	F	M	F	M	F	M	F	M	
Living arrangement											
Live with others	18,564	21,000	71.0	83.4	3.3	7.3	7.1	6.6	11.3	10.8	
Live alone	7,576	4,171	29.0	16.7	6.2	7.4	12.6	10.9	20.1	16.0	
Total	26,140	25,171	100	100	4.1	7.3	8.7	7.3	13.9	11.7	
Social participation											
Frequent	23,590	21,765	90.4	86.6	4.2	7.4	8.5	7.0	13.3	11.1	
Infrequent	2,518	3,376	9.6	13.4	3.4	6.8	10.9	9.3	19.0	15.2	
Total	26,108	25,141	100	100	4.1	7.3	8.7	7.3	13.9	11.7	
Social isolation											
Not lonely	18,878	19,684	72.4	78.4	3.8	7.3	8.0	6.6	12.5	10.8	
Lonely	7,205	5,417	27.6	21.6	4.9	7.3	10.6	9.9	17.3	14.6	
Total	26,083	25,101	100	100	4.1	7.3	8.7	7.3	13.9	11.7	

Note. ^aUse of hearing, vision, and mobility devices, representing % associated row total given sex and socio-demographic characteristics. For example, 1.8% of white females in the 45–64-year-old group reported using hearing devices (shown) whereas 98.2% of white female in the same group did not report use of hearing devices (not shown). ^b Participants were asked: “People living in Canada come from many different cultural and racial backgrounds. Are you...?” Response options were: White, Chinese, South Asian, Black, Filipino, Latin American, Southeast Asian, Arab, West Asian, Japanese, Korean, North American Indian, Inuit, Metis, and Other. Participants could select multiple options from the list. When responses did not fall into a single category of White, they were categorized as “Other”.